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COMMONWEALTH PHYTOPATHOLOGICAL NEWS

A QUARTERLY REVIEW OF NEWS AND VIEWS ISSUED BY THE COMMONWEALTH MYCOLOGICAL INSTITUTE, KEW, SURREY

HERB. I.M.I. AND THE IDENTIFICATION SERVICE

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One of the two main objectives of the C. M. I. at the time when it started as the Imperial Bureau of Mycology in September 1920 was the naming of fungi injurious to crop plants. Up to the outbreak of the last World War nearly all specimens sent in for identification were plant pathogens; since the war, however, there has been an ever increasing number of requests for moulds of importance in industry and fungi isolated in the search for new antibiotics to be named. Veterinary and medical mycologists ask for our help. This has necessitated several important changes in the set-up of the identification service; it has underlined the importance of maintaining a living culture collection, has drawn attention to a real shortage of reliable monographs dealing with certain groups of fungi and the need for a great deal more taxonomic work to be done. Keys based on host plant-fungus relationships and on the location of fungus fructifications in, on or emerging from natural substrata are of little value when a fungus is received in a test-tube.

Matching Specimens

In all herbaria great importance is attached to the matching of unnamed specimens against named ones. If the first specimen of a species deposited in your herbarium is incorrectly named it follows that all future specimens matched against it will be wrongly named also. The only way to be at all sure that the first specimen is correctly named is to compare it with either the type collection of the species, or an authenticated specimen. With the permission of the director and through the kindness of Miss E. M. Wakefield O. B. E. and Dr. R. W. G. Dennis many of the first specimens of a species in Herb. I. M. I. have been directly matched against type collections in the Herbarium of the Royal Botanic Gardens, Kew. Curators of other herbaria also have been most helpful in lending us types. The borrowing and returning of specimens is, however, a slow process. To speed up the matching of specimens our mycologists from time to time visit other herbaria. These visits are of the greatest value to the herbarium. Often several hundred specimens can be matched during a single visit.

Storing and Locating Specimens

Named specimens have to be properly looked after, labelled and numbered so that each one can be referred to precisely and stored in such a way that visitors as well as members of staff can find them easily and quickly. Every specimen is carefully catalogued and cross-indexed under fungus and host names and the

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The editor does not necessarily agree with opinions expressed in C. P. NEWS by correspondents whose forum it is.

location of each genus in the herbarium is shown in our genus disposition book. We like to have large representative collections because plant pathologists and others from different parts of the Commonwealth and mycologists from other herbaria visit Herb. I.M.I. from time to time, and when they do they are encouraged to examine specimens. We also like students to work here, but can supply them with material only if this is available in sufficient quantity. To accomodate specimens received at the present rate two new herbarium cabinets are needed each year.

The Mycologists

Although nearly every mycologist at the C.M.I. does some identification work many of them have other duties which occupy much or in some cases almost all of their time. Miss Waterhouse, who deals with Phycomycetes other than Mucorales and is an authority on the genus Phytophthora, helps to edit R.A.M. and prepares the BIBLIOGRAPHY OF SYSTEMATIC MYCOLOGY. Dr. Ainsworth identifies the smut fungi and edits R.A.M. and the REVIEW OF MEDICAL AND VETERINARY MYCOLOGY. H.A. Dade has the Mucorales and species of Aspergillus but is also Assistant Director and runs the Culture Collection. F.C. Deighton is chiefly interested in Cercospora and allied genera and in West African fungi; he also checks and edits the INDEX OF FUNGI. K.A. Pirozynski deals with general identifications especially of Ascomycetes and also prepares the DISTRIBUTION MAPS OF PLANT DISEASES. Dr. Booth examines Pyrenomycetes and specialises in the Hypocreales and their conidial states including Fusarium. J.J. Elphick has all species of Penicillium, Paecilomyces and Sporotrichum and helps with Aspergillus and the Mucorales and Dr. Davies is interested in slimy-spored Hyphomycetes; between them they cope with many of our culture fungi. Other groups are covered by B.C. Sutton (Coelomycetes) and G.F. Laundon (Basidiomycetes, especially Uredinales). My own special interest is in the dry-spored Hyphomycetes including Helminthosporium and its allies. In the year 1921-22 with 3 mycologists on the staff fewer than 200 specimens were examined, in 1938-39 with 6 mycologists the number of specimens rose to 500, in 1958-59 the 11 mycologists named more than 4,000.

Technica Assistants

Before a fungus can be identified microscopic preparations which demonstrate its structure clearly and precisely must be made. Sometimes a small colony of a fungus scraped from its substratum and mounted on a slide in lacto-phenol cotton blue and warmed after the coverslip has been put on provides a sufficiently good preparation, but often this is not enough. Thin sections may have to be cut with a freezing microtome, fragile colonies removed by the 'necol' technique, single-spore isolations made, or slide cultures prepared. These very useful but time-consuming operations are carried out most efficiently by our technical assistants, who also lay-in all specimens, dry down cultures, disinfest collections, and fumigate cupboards.

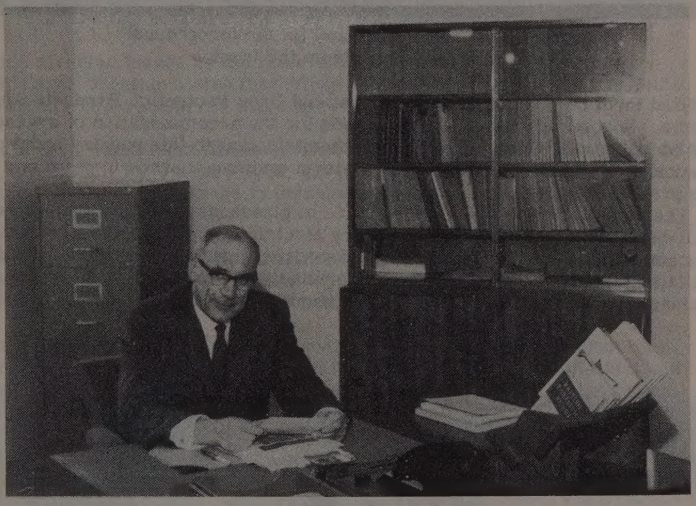
Books and Reprints

In the herbarium we have an excellent small library of books and reprints dealing with the taxonomy of fungi. We need more accurate descriptions of fungi, fuller accounts of their life-histories and cultural characters, clear photographs and drawings, and a system of classification which will enable us to identify specimens either on natural substrata or in culture. This need is being met gradually and a very fair contribution made by our mycologists who spend much of their own time writing MYCOLOGICAL PAPERS which are published by the C.M.I. THE DICTIONARY OF FUNGI compiled by Dr. Ainsworth in collaboration with the late Dr. Bisby should be in every mycological laboratory and herbarium. The fifth and much enlarged edition is now in the press and should be issued before the end of 1960.

THE NEW PLANT PATHOLOGY LABORATORY, HARPENDEN

OFFICIAL OPENING

On 13th May last the Minister of Agriculture, Fisheries and Food, the Right Hon. John Hare, opened the new buildings of the Plant Pathology Laboratory at Hatching Green, Harpenden. In his address the Minister recalled that it was forty-three years since the Laboratory was founded at the Royal Botanic Gardens, Kew, and forty years since it moved to Harpenden. Familiarly known for years as the "Path. Lab." it had gradually established itself as a scientific liaison centre and source of advice on all aspects of plant diseases and pests, and now formed an important link in the complex relations which exist today between science, industry, and the farmer. The converted private house it had occupied for so many years in

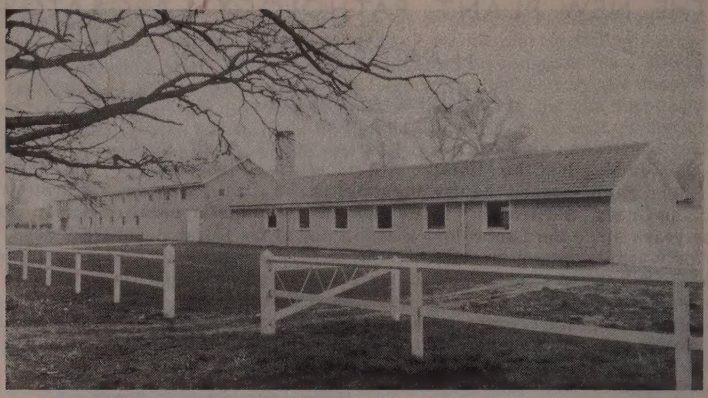


A corner of the Director's office

Milton Road had been well enough with the pre-war staff of ten, but it became more and more inadequate as the work and staff increased. Now the Ministry of Works had given the Laboratory a most modern and efficient new building which provided their scientists with the conditions needed to do their work properly.

The new Laboratory is built on a site of nearly six acres purchased by the Lawes Agricultural Trust and made available to the Ministry of Works on long lease. It is situated in very pleasant surroundings on the edge of the Rothamsted Experimental Station campus. The main building is L-shaped in form and provides ample accommodation for the present staff of sixty, which includes thirty-five plant pathologists, entomologists, and crop protection chemists in roughly equal numbers. Its design is such as to permit ready expansion if and when the time comes. Most of the rooms serve the double purpose of laboratory and office, but there are also general laboratories for mycology, bacteriology, and nematology as well as two chemistry research laboratories and three-air-conditioned rooms for experimental work on the fumigation of seeds and plant material. In addition, there is a combined conference and training room, also photographic department, library, insect museum, general office, and workshop.

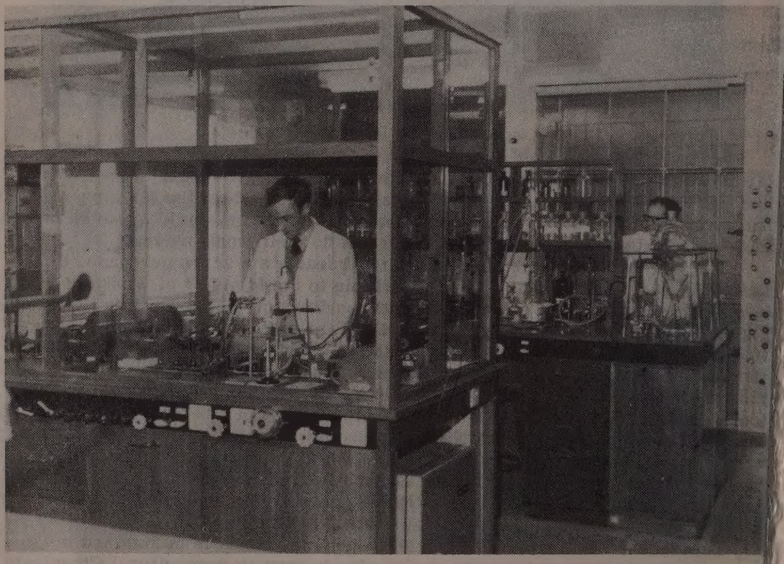
The National Collection of Plant Pathogenic Bacteria is maintained in the bacteriology section, and the chemistry wing houses an Agricultural Chemicals Approval Organization which came into being on 1st June to replace and continue in



The main Laboratory and (in the foreground) outbuildings, from the front

modified form the task of the twenty-year old Crop Protection Products Approva Scheme. Special provision has been made for the accommodation of overseas plant pathologists, entomologists, and chemists sent to this country under technical assistance schemes for short-term training courses in pathology and crop protection.

The outbuildings include 2,000 sq. ft. of glasshouses, which are heated by small-bore hot water pores and auxiliary electric fan heaters, both thermostatically controlled. The section intended for virus work has additional forced fan ventilation, but all compartments can be made aphid proof. The bench tops are concrete troughs which permit sub-irrigation of the plants.



One of the chemistry research laboratories

FROM NEAR AND FAR

Imperial College, London, is to have a new laboratory specially equipped for post-graduate research in nematology at Silwood. This will be the first of its kind in the Commonwealth and will cost about £30,000, to which Shell International Chemical Coy. will contribute $15,000. The work will be under the direction of Prof. B.G. Peters, professor of parasitology.

H.M. the Queen opened the tercentenary celebrations of the Royal Society at a ceremony at the Royal Albert Hall, London, on July 19.

Of the 1,200 National Science Foundation of the U.S.A. graduate fellowships for 1960-61, 233 were awarded for biological sciences, 946 for physical, and 21 in social science.

In the 1959 volume of the REVIEW OF APPLIED MYCOLOGY 1,200 diseases due to fungi and bacteria are reported on 650 host plants.

In a circular issued by the Inter-African Phytosanitary Commission [IAPSC] J.M. Whellan states that citrus canker and "cankrosis B" in South America are now considered there to be the same disease.

Reichert, Bental and Ginsburg draw attention in F.A.O. PLANT PROTECTION BULLETIN for January 1960, p. 43, to the natural occurrence of citrus tristeza virus in sweet orange in Israel and suspect its presence in other Mediterranean countries.

A conference of forest pathologists of the U.K. Forestry Commission on Fomes annosus was held in Scotland from May 30 to June 4. A report on matters of interest for C.P. NEWS has been promised.

Dr. Keith Jones of the Plant Breeding Station, Aberystwyth, has been appointed cytogeneticist at the Royal Botanic Gardens, Kew. This is a new departure for the Herbarium and promises rewarding results in the future. Reorganization of the Museums is also contemplated, the first move having been made by the reversion of the beautiful orangery to its original use. The Jodrell laboratory is to be rebuilt and it is proposed to include in the building a lecture hall for the convenience of the many parties which visit the Gardens.

Reconstruction of some of the glasshouses is also planned and growth chambers are to be installed to assist in the preparation of plants for display.

Wye College proposes to build a new research library in memory of the late Prof. E.S. Salmon who died last year. It will be known as the Ernest Salmon Library and will cost about £5,000. Donations may be sent to the Secretary, Wye College, Ashford, Kent.

The first International Congress on Histochemistry and Cytochemistry is to be held in Paris from 28 August to 3 September 1960, organized by the Société Francaise d'Histochemie. The secretary general is Dr. R. Wegmann, Institut d'Histochemie Medicale, 45, rue des Saints-Pères, Paris, 6.

The National Library of Science and Invention of the U.K. is to be combined with the scientific books of the British Museum and to be housed in the new Patent Office to be erected on the Thames South Bank, starting in 1963.

Publications of Interest

Diseases and Pests of Ornamental Plants. 3rd. Ed., 1960. (Pirone, Dodge and Rickett. New York, The Ronald Press. $10 net.). It is 12 years since the second edition of this useful book was published and the appearance of the third edition is welcome. Its semi-popular style makes it a suitable guide for field officers, horticulturists, and gardeners, but it is also a very

handy book of reference for plant pathologists especially those who have to deal with plant diseases in the tropics and sub-tropics.

Mary T. Franklin and D. J. Hooper have compiled a list of plants showing partial or complete resistance to root-knot nematodes (Meloidogyne spp.), which should be of great assistance to all plant pathologists. Details are given of species and varietal names of hosts, breeding lines and strains where known, and the nematode to which they are resistant. There is also an extensive bibliography. (Farnham Royal. C.A.B. 1959. 7s. 6d.)

For many years visitors to C.M.I. have expressed the wish that there should be published an account of the methods and techniques in use in the Herbarium, Culture Collection, and elsewhere. This wish will soon be gratified. The staff have collaborated to produce a small handbook called HERB. I.M.I. [Kew, Commonwealth Mycological Institute. 30s. pp. 103, 6 plates, 8 figs., Crown 8vo. 1960] which gives not only the details of methods employed but also the principles involved, as well as notes on collecting, preservation of material, and recording. It is expected to issue the book, which is dedicated to Mr. E.W. Mason for his life work on mycology, before the Sixth Commonwealth Mycological Conference.

C.M.I. LIBRARY

Visitors coming to the C.M.I. on the occasion of the Sixth Commonwealth Mycological Conference in July will be interested to note a number of changes which have taken place in the Library.

The original arrangement of rows of dark green shelving has been improved by turning round some of the cases, but it would certainly be difficult to bring back the elegance of the room as it was arranged for the visit of the Duke of Edinburgh in July, 1955, when there were no shelves at all but in their place a red carpet and potted plants from Kew.

A bright and pleasant reading room has been formed and in it have been placed the catalogues of the journals, books, and reprints to be found in the Library and in other parts of the Institute.

Abstracting journals have been brought together against the wall, and the most used books and periodicals on the subjects of mycology and plant pathology occupy the other two sides of the room.

A small end case facing the door contains reference material.

A little further down the Library a new geographical section has been formed and here the Distribution Maps of Plant Diseases are prepared.

At the far end of the Library, a bibliographical and index room has been forme Here, part of the indexing of the REVIEW OF APPLIED MYCOLOGY is done, and bibliographical lists of plant diseases are prepared.

In the stacks running from the left of the door to the indexing alcove at the opposite end of the Library, the journals are arranged by place of publication in this order: Europe, Asia, Africa, North America, Central America and West Indies, South America, Australasia, and Oceania.

For greater convenience, however, the following groups have been collected in the cases running down the centre of the Library, on the left: Microbiology, Reports of the British research stations, KEW BULLETIN, NATURE, forestry an some of the more important Commonwealth journals. Medical mycology journals are to be found just outside the bibliographical and index room.

The Reprint Collection is arranged, by author, in boxes in the stacks to the right of the door, running from the far windows to the reading room section.

Books on agriculture, which are octavo or quarto in size, are to be found in the large case running down the centre of the Library on the right. Conferences a bibliographical material are also collected in this case. Folios on agriculture are to be found at the far end of the Library in the small end case nearest the bibliographical and index room.

Apart from borrowing books from other libraries for the Herbarium and Cult Collection, the main day-to-day work of the Library is connected with the product of the REVIEWS, and it may be of interest to readers to say a word about this.

One of the major Library projects this year, apart from the recataloguing of the Library and the making up of arrears of binding, has been the revision of the List of Periodical and Serial Publications examined for the Review of Applied Myc

These periodicals and serial publications, together with reprints and books

are all obtained through the Library in various ways and account for most of the Library's clerical work. The books are generally acquired as review copies. These are sometimes offered by the publisher, but if not, they are requested by the Library. Reprints are often sent to the Institute as a gift by the author, but the Library very often has to write requesting them. Periodicals are obtained by gift, exchange, purchase, or borrowing. Periodicals are borrowed from libraries such as Kew, D.S.I.R., or from the Botanical Pool, which is run by the Commonwealth Foresty Bureau. Another form of borrowing is that of scanning at outside libraries by C.M.I. abstractors. In the case of the REVIEW OF MEDICAL AND VETERINARY MYCOLOGY outside scanning is done for the Institute in South America by Dr. J. Mackinnon.

As the material to be abstracted passes from the editors to the abstractors and back and then to the Library, it is necessary to be able to lay hands on a given paper at a moment's notice. This the Library attempts to be able to do by simplifying routines wherever possible and rearranging its layout for the greatest convenience to the users.

At present, the Library has the appearance of 'under development', but we hope that any minor inconveniences at present will be outweighed by the improved service which will come later.

STOCK: Books 2,500; Journals, 600; Reprints 53,100; Microfilms, 2,746.

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to the Fellowship of the Imperial College of Science and Technology, London.

Dr. John Colhoun, reader in mycology at Queen's University, Belfast, has succeeded Prof. C.W. Wardlaw in the Chair of Cryptogamic Botany at the University of Manchester. Prof. Wardlaw now occupies the George Harrison Chair of Botany.

Prof. J.H. Burnett, dean of the Faculty of Science at St. Andrew's University and chairman of the Scottish Horticultural Research Institute has been appointed to the Chair of Botany, Durham University (Newcastle Division).

Dr. C.J. Hickman, reader in mycology at the University of Nottingham, has been appointed to the Chair of Botany at the University of Western Ontario, not the University of Ontario as stated in the April C.P. NEWS.

Dr. G.E. Fogg, reader in Botany at University College, London, has been appointed to the Chair of Botany at Westfield College.

D.S.I.R. state that owing to pressure of work at headquarters H. Wooldridge O.B.E. will not take up the post of directorship of the Forest Products Research Laboratory, Princes Risborough as previously announced. The new director will be A.C. Copisarow, scientific attaché in Paris.

Linnean Society

The following have been elected for the year 1960-61.

President: Prof. C.F.A. Pantin
Treasurer: The Earl of Cranbrook
Secretaries: Dr. C.R. Metcalfe (botany), Dr. H.G. Vevers (Zoology), Dr. John Smart (editorial)
Vice-Presidents: E.J.H. Corner, The Earl of Cranbrook, Asst. Prof. H.R. Hewer, and Dr. W.G. Templeman
New Members of Council: Dr. A.J. Cain, Prof. A.R. Clapham, Dr. W.P. Crowcroft, F.C. Deighton, and J.F. Levy.

Awards

The following were announced in the last Birthday Honours list: C.B.E., Dr. F.R. Tubbs, director, East Malling Research Station. O.B.E., Dr. Mary Glynne, Rothamsted Experimental Station and V.S. Summerhayes, R.B.G. Herbarium, Kew.

PERSONAL NEWS

C.M.I. News

Miss Phyllis Stockdale of the London School of Hygiene and Tropical Medicine was appointed mycologist on July 1. She will take up duties in the Culture Collection laboratory.

Attention is drawn to the technique for the determination of Pseudomonas solanacearum described by A.C. Hayward in NATURE, LOND., No. 4722: 405, of 30 April 1960. Comments from plant pathologists would be welcomed at C.M.I.

Mr. A.E. Trotman C.M.G., Minister of Natural Resources, Tanganyika Territory, has been selected to succeed Sir Herbert Howard as Secretary of the Commonwealth Agricultural Bureaux when the latter retires at the end of December 1960. Mr. Trotman will commence duty when the "Review" Conference meets in August this year.

Miss Constance Garrett, plant pathologist at East Malling Research Station, who is studying fireblight of pears, spent a week at C.M.I. working in the bacteriology laboratory.

W.P. Ting, plant pathologist, Malaya Department of Agriculture, spent three months studying material and techniques in the Herbarium, and C.L.A. Leaky of Exeter University worked for three weeks on Colletotrichum. Other visitors who have worked in the Herbarium are E.B. Gareth-Jones, Portsmouth College of Technology, Miss Flora Lloyd, Imperial College of Science and Technology, Miss N.H. Ebbens, Glasshouse Crops Research Institute, and Miss A. Wooster, Goldsmith College.

Visitors

Among overseas visitors have been Dr. C.C. Allison, U.S.A.; Dr. and Mrs. Roger D. Baker, U.S.A.; Dr. John S. Boyce, U.S.A.; M.V. Carter, Australia; D.M. Dring, P.D. Turner, and A.L. Wharton, Ghana; Dr. A.B. Ferranti, Malta; Dr. Marina E. Fowler, U.S.A.; E.F. Iton, Trinidad; C. Logan, Uganda; Dr. V.C. Neethling, South Africa; Dr. Irena Rdzanek, Poland; Drs. R.D. Tinline and Anne Kincade, Canada.

Dr. S.R. Chant brought a party of students from the Chelsea College of Science and Technology and Prof. Noel Robertson also brought a party from Hull University.

Appointments, Promotions, Retirements, etc.

The Overseas Division of the Colonial Office announce the following appointments: G.W. Anderson, deputy director of agriculture, Uganda; G.R. Henderson, assistant director of agriculture (field), Kenya; M.F.H. Selby, deputy director and E. Williams, director of agriculture, Nyasaland.

Dr. D.J. Carr has been appointed professor of botany in Queen's University, Belfast.

Prof. R.L. Wain of Wye College has been elected a Fellow of the Royal Society and has been awarded the Research Medal of the Royal Agricultural Society of England.

Dr. Albert H. Moseman has been appointed director for the agricultural sciences in the Rockefeller Foundation. He was made associate director in 1956, and was awarded the Outstanding Achievement Award of the University of Minnesota in 1958.

Prof. F.G. Gregory, professor emeritus of plant physiology, has been elected

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OVERSEAS NEWS

AUSTRALIA

Conference on Root Rots of Wheat

At its 58th and 59th Meetings the Standing Committee on Agriculture considered recommendations from the Wheat Industry Research Council relating to the holding of a Conference on Root Rots of Wheat, which were submitted by the Victorian Department of Agriculture and the Department of Primary Industry. The Australian Agricultural Council subsequently approved the holding of a conference on this subject at the Agricultural Research Institute and the Agricultural College, Wagga, New South Wales, early in 1960, and C.S.I.R.O. was asked to convene it in collaboration with the New South Wales Department of Agriculture.

The Organizing Committee comprised Dr. F.C. Butler (Chairman), Dr. C.R. Millikan, Dr. N.T. Flentje, Mr. W.B. Miller and Mr. P.F. Butler (Secretary).

The Conference was held at the Wagga Agricultural College from 11th to 13th April, 1960, and was officially opened by Dr. H.J. Hynes, Director, Department of Agriculture, New South Wales. Twenty-seven delegates attended, representing all State Departments of Agriculture, C.S.I.R.O., the Universities of Adelaide and Sydney, the Commonwealth Department of Primary Industry and the Wheat Industry Research Council.

Nine review papers were presented and there was much discussion.

Although no precise data are available, it is recognised that the root- and foot-rot conditions of wheat and other cereals are regularly responsible for substantial yield losses in Australia. The relative importance of these diseases varies according to the region, as one might expect in so large a country, but it seems clear that take-all (Ophiobolus graminis), common root rot (Fusarium culmorum, Helminthosporium sativum and Curvularia ramosa), and root diseases caused by Fusarium graminearum, Corticium solani and the nematode, Heterodera avenae, are of greatest importance. F. graminearum is particularly damaging on the black earth soils of Queensland and north-western N.S.W.

The difficulty of accurately assessing yield losses, inadequate knowledge of the host ranges of the fungi, and an incomplete understanding of the effects of environment have combined to make the recommendation of control measures extremely difficult. Since seed treatment is of little value and since resistant varieties have not yet been developed, control measures are at present limited to the adoption of practices which restrict the development and persistence of the causal fungi in the soil, on the one hand, and promote vigorous host plant growth on the other.

The conference devoted some time to the drafting and discussion of ten resolutions emphasising those aspects of the problem most in need of attention and recommended, amongst other things, that a review of the literature on root rots of wheat, prepared by Dr. F.C. Butler, should be published, that more surveys be carried out to assess the importance of these diseases, that the effects of environmental factors, agronomic practices, and host physiology be studied, that further basic studies be made on the survival, modes of infection, and subsequent progress of the parasites, that host range studies be made, and that breeding for resistance be further investigated.

Grapefruit Stem Pitting

Grapefruit stem pitting is a major threat to grapefruit production in Australia, and as the virus is present in most citrus symptomlessly, and is transmitted by the very common black citrus aphid, Toxoptera aurantii, there is little prospect of establishing an industry based on virus-free stock. The virus exists in a large number of strains, some of which do not materially depress vigour or distort fruit and it has been hoped that such mild strains could be used to protect trees from field infection by fruit distorting strains. The Citrus Improvement Committee of the N.S.W. Department of Agriculture commenced experimental planting with the object of testing this eight years ago. Virus free nucellar Marsh grapefruit, and trees of the same bud line, inoculated with six selected

mild strains, were planted at the Citrus Research Station at Somersby. To date the inoculated trees have produced fruit showing little or no effect of virus infection. Dr. L.R. Fraser reports that this season for the first time two of the uninoculated trees are carrying a crop of small distorted fruit, indicating that they have become affected with a severe strain of the virus.

C.J. Magee

INDIA

Chlorosis of Sorghum vulgare

The disease is characterised by chlorotic patches on leaves, which run along the veins in an irregular manner. When infected young, the plants either do not produce a head or only a small sterile one. The diseased plants are stunted and give rise to numerous tillers at the base.

The disease has been shown to be of a virus nature. It cannot be transmitted mechanically, but is transmitted with ease by Peregrinus simplicia Dist, which breeds on 'Jowar' plants in abundance. The disease appears to be distinct from mottle and streak of maize reported from Africa or from corn stunt reported from California. It also infects maize (Zea mays) and sugarcane (Saccharum officinarum).

Beet Purple Leaf

The disease has been found to be of common occurrence and is caused by a strain of tobacco mosaic virus. This is the first record of TMV infecting Beta vulgaris systemically.

Citrus Decline

The disease has been reported earlier in C.P. NEWS, vol. 4, part 4, 1958, and attributed to tristeza virus. Aphis gossypii Glov. and Myzus persicae Sulz. have been shown to be additional vectors of the virus.

Tobacco Viruses

Tobacco yellow-net virus, causing yellow net symptoms in tobacco, has been transmitted by grafting as well as through the vector Bemisia tabaci Gen. The virus is transmissible to a number of Nicotiana species and Beta vulgaris.

Cassia tora has been found to be a local lesion host for tobacco mosaic virus.

Division of Mycology and Plant Pathology, R.S. Vasudeva
Indian Agricultural Research Institute.

CONFERENCE ACTIVITY IN INDIA

The 4th All India Conference of Sugarcane Research and Development Workers was held at Waltair (Andhra Pradesh) from 4 to 8 January, 1960. Dr. R.S. Vasudeva, Head of Mycology and Plant Pathology Division, Indian Agricultural Research Institute, New Delhi, presided over the deliberations of the Sugarcane Pathology Section. In his Presidential Address, he discussed the nature of host resistance to sugarcane red rot organism (Glomerella tucumanensis) which is responsible for very serious losses to the sugar industry in India. It was pointed out that the passage of the fungus through a resistant host as also the association of physiologically compatible strains might offer an explanation for the periodic flare up of this disease in an epidemic form. Discussing the nutrition-inhibition hypothesis regarding host-parasite relationship, it was suggested that elucidation of the mechanism of resistance in this disease, with the aid of induced mutants, might help in developing sound control measures for red rot disease.

Thirteen papers were read and discussed on various aspects of sugarcane pathology by different delegates. In two of the papers contributed by the workers from I.A.R.I., one recorded the occurrence of a new strain of Colletotrichum falcatum Went which formed a large number of stromatic masses on oatmeal agar. These masses were found to withstand exposure to moist heat for 10 minutes at 60°C. and of dry heat for one hour at 85°C., thus indicating the better suitability of this strain to survive through adverse environmental conditions. In another paper, it was pointed out that there was positive correlation between the linear spread of infection and the number of internodes traversed by the red rot pathogen, thus indicating the possibility of this being used as a criterion for screening cane varieties against red rot greatly facilitating the recording of observations for varietal resistance.

Work done at the Aligarh University on the germination of chlamydospores of Ustilago scitaminea showed that percentage germination and spore size in different collections varied in different concentrations of the media used. At the Sugarcane Research Station, Anakapalle, studies made on the nature of resistance to smut disease, which included such factors as morphological features of the bud, water and fibre contents of the eye-bud, spore-load and viability of smut spores lodged on the bud scales, did not yield any positive correlation. At the Sugarcane Breeding Institute, Coimbatore, it has been shown that isolates of C. falcatum and Fusarium moniliforme in culture complimented the nutritional requirements of each other.

The annual meeting of the Indian Phytopathological Society, was held on 3 January, 1960. Dr. R. Prasada in his Presidential Address discussed the control of wheat rusts in India. He pointed out that while growing of resistant varieties is a useful practical proposition one or two sulphur dustings to the rust-tolerant varieties, which would ordinarily show 25 per cent. reduction in yield as compared to susceptible varieties, may be well repaid by enhanced yields. Sulphur dusting of wheat in the hills, which are the foci of infection for the plains, as a measure of direct control of the disease is strongly recommended, not only to increase the yield by protection of the crop locally, but also to reduce the inoculum potential for the major wheat crop in the plains.

PERSONAL NOTES

Dr. B.L. Chona, Plant Pathologist has been elected as President of the Agricultural Sciences section of Indian Science Congress to be held at Roorkee in January, 1961.

Mr. T.S. Ramakrishnan, Plant Pathologist, Rubber Board, has been elected President of the Indian Phytopathological Society for 1960.

BRITISH GUIANA

THE BLOB DISEASE OF SUGARCANE

Considerable alarm was caused recently among sugar estate workers in British Guiana by the sudden appearance, in localised areas, of numerous black spots on the leaves and spindle tissue of the canes. These spots or blobs, resembling tar splashes, frequently measured up to 4 mm. in diameter and were found up to a height of 8 ft. from the ground. At first a virus, or even insect or snail eggs, were postulated as the cause, but closer examination showed the blobs to be the spore masses of a perfectly harmless fungus which was growing on the soil surface among the filter press muds. At maturity these masses were shot into the air with considerable force and stuck fast to whatever came in their way. Specimens of the fungus were sent to the C.M.I. for identification and proved to be Sphaerobolus stellatus (Tode) Pers., a member of the Gasteromycetes, which is not uncommon on rotting wood, dung, and various other materials.

The "Sphaerobolus-gun" is outstanding among the many ingenious methods evolved by fungi for the dissemination of their spores. At first the spore-mass, or gleba, is enclosed by a wall, or peridium, but this soon splits and peels back

to reveal the gleba lying in its cup-like base. The inner layer of the peridial wall then absorbs water and tends to expand, setting up tissue tensions which are finally released by the sudden eversion of this inner layer. The process of eversion is accomplished with such violence that the gleba is catapulted high into the air and a clearly audible "snap" is heard. Buller observed one gleba to be shot to a height of 14 ft. 5 ins, while another travelled a horizontal distance of 18 ft 7 ins. Hence although Sphaerobolus may cause little trepidation as a plant pathogen, it is certainly the most impressive of all mycological ballistic missiles.

NECTRIACEOUS PERITHECIA

An appeal for fresh material

C. Booth

For some time work has been proceeding at C.M.I. on species of Nectria and allied genera found in the tropics. We have been particularly interested in those occurring on economic hosts such as tea, coffee, cacao, banana, and certain Palmae, although in most cases they are not thought to be host specific. The object of these investigations has been to identify correctly the perithecia and also, which is probably more important, to identify the conidial states which are frequently received, as isolations, from pathologists.

These conidial states belong to such genera as Fusarium, Cylindrocladium, Cephalosporium, Gliocladium, Verticillium, Graphium, Stilbum, Dendrodochium, Myrothecium, Tubercularia, Volutella, Coniella, and Zythia.

As many nectrias have more than one conidial state there can be little value in giving specific names that do not show their true relationship. In any case, each species should have one name, based on its perfect state, and the conidial state should be referred to as, e.g. the Gliocladium state of Nectria ochroleuca.

The reason for the popularity of the conidial states is that they are the first to appear on diseased material. Perithecia appear later, generally after the host has died, and hence are not readily observed.

From the progress already made, available evidence suggests that the perithecia fall into a series of natural groups determined by the structure of their perithecial wall and ascus, and that each of these groups produce a well-defined conidial state or states.

If a sufficient number of fresh collections of Nectriaceous perithecia are obtained then their inter-relationship and their conidial states can be established and the nomenclature of the whole revised.

CONIOTHYRIUM LEAF-SPOT ON SACCHARUM

In the past two years we have received at the C.M.I. five collections of a Coniothyrium leaf spot on sugar cane. In August 1958, Dr. Nattrass sent us a similar leaf spot on sugar cane from Kenya, but on these spots perithecia of a Leptosphaeria were present. These were identified as Leptosphaeria michotii (Westend.) Sacc. and isolations of the ascospores produced a Coniothyrium conidial state identical with that causing the leaf spot on our other collection. The life-history of this species was published by Dr. Webster (1955) and he gave a full description of the Coniothyrium conidia.

Collections of this species on sugarcane have now been received from British Guiana, British Solomon Island Protectorate, and Kenya.

REFERENCE

J. Webster, TRANS. BRIT. MYCOL. SOC., 38: 347-365, 1955.

●● Dr. S.A.J. Tarr has now completed a book on diseases of Sorghum which is being prepared for press. It is expected that it will be published in late 1960 or early 1961.

HEART ROT OF SAL IN INDIA

B.K. Bakshi
Forest Research Institute & Colleges, Dehra Dun, India

Sal (Shorea robusta Gaertn.) is one of the important timber trees of India. The species, however, suffers from heart rot in all localities in its extensive range of distribution. In a recent study in a high forest worked on the Uniform System, in the Timli range, Uttar Pradesh State, 513 sal trees, out of a total of 704 examined, were found to contain heart rot. Nearly 73 per cent. of the trees were thus infected, entailing a loss of 9.37 per cent. of timber. The actual loss is greater because, in some cases, the sound wood from a diseased tree may not be put to proper use. For example, sal is greatly valued for beams and railway sleepers. The requisite lengths of sound wood may not be obtained if there is heart-rot in the tree. Fomes caryophylli and Hymenochaete rubiginosa were the principal fungi causing decay.

Sal is susceptible to heart rot at an early age, when the species is frost tender and subjected to damage by fire and other injuries. Later on, opportunities for infection multiply, and knots, branch stubs, dead branches, and wounds are the principal avenue of entry of heart rot fungi.

Green sal trees marked for felling are classified according to soundness and growth. Sal trees attacked by heart rot fungi do not usually present reliable external evidences of decay. This may lead to faulty marking of the trees, which disturbs timber forecast and also entails loss to the Government or the contractor to whom the trees are normally sold.

The usefulness of external symptoms in sal as indicators of heart rot is given in table 1. Sporophores indicate decay in all cases, but unfortunately sporophores do not develop with great frequency. Wounds and swollen boles are next in importance. Branch stubs and dead branches have a low significance. Knots were rated as to their frequency and trees with a higher number of knots showed greater incidence of decay. Epicormic branches are not correlated to heart rot. In advanced stages of butt and trunk rot, the affected trees emit a hollow sound when struck on wood by a hammer. This gives a good indication of decay.

Table 1. Significance of external symptoms as indicators of heart rot in sal (Basis 704 trees)

Indicators		Indicators with decay	
Nature	Number	Number	per cent.
1. Sporophore	57	57	100
2. Wounds	75	64	85·33
3. Swollen bole	136	110	80·80
4. Branch stubs and dead branches	2334	265	11·35
5. Fork	315	17	5·39

In addition to the clear length of the bole, the indicators stated above should be taken into account to classify correctly trees during marking.

Diameter in Relation to Decay

The incidence of decayed trees and also the average gross and decay volumes in a tree at different diameter classes are given in table 2. Trees below 12 inches d.b.h. were not included for study.

Table 2. Incidence of decay and gross and decay volumes at diameter classes (Basis 704 trees)

Diameter at breast height (ins.)	No. of trees examined	No. of trees infected	Percentage of infected trees	Average gross vol. / tree (c. ft.)	Average decay volume/tree (c. ft.)
a	b	c	d	e	f
12-16	253	179	70·75	24·43	2·47
16-20	237	168	70·89	41·43	3·09
20-24	141	106	75·18	63·40	6·97
24-28	55	44	80·00	96·21	8·40
28-32	10	9	90:00	142·88	11·90
32-36	8	7	87·53	142·80	21·05

Though the number of decay cases increased with increasing diameters, it was high at 12 to 16 inches d. b. h. when the trees were comparatively young. The average decay volume in a tree showed a steady increase with further rise in the diameter class. This is mainly due to the fact that heart rot is a progressive decay so that more and more timber is decayed with age. In trees of 28-32 inches d. b. h. class, decay increased at a rapid rate. However, for silvicultural reasons it may be necessary to keep at least some of the larger trees.

In certain parts of the eastern States of India sal is raised as a coppice crop on short rotation, mainly for fuelwood. These forests, mostly privately owned until recently, were subjected to maltreatments like browsing, burning, and illicit cutting in the past. Unregulated cutting has resulted in decay setting in in the coppice stumps as heart rot. On a short rotation of 10-15 years the coppice crop is apparently healthy. If, however, the rotation is increased beyond 20 years, about which time the heartwood develops in sal, the heartwood is bridged between the stump and the coppice and decay in the former migrates into the latter.

Control or reduction of heart rot in sal in high forests can be secured through proper silviculture and management practices, particularly during the period of susceptibility of trees at an early age. These include control of fire and irregular fellings and adjustment of overhead canopy to prevent frost damage and suppression. Suitable stand density should be maintained to control the number and size of side branches. Thinnings and selection fellings should aim at improvement in the health of the stand by preventing felling and logging injuries.

In coppice sal with heart rot in the stumps, the rotation cannot be increased without loss of timber through decay. Management of such areas should involve gradual change over from coppice to seedling crop. When the latter is established, the coppice may be cut down and the stumps prevented from further coppicing by extraction, or girdling the live tissues and killing them with poison.

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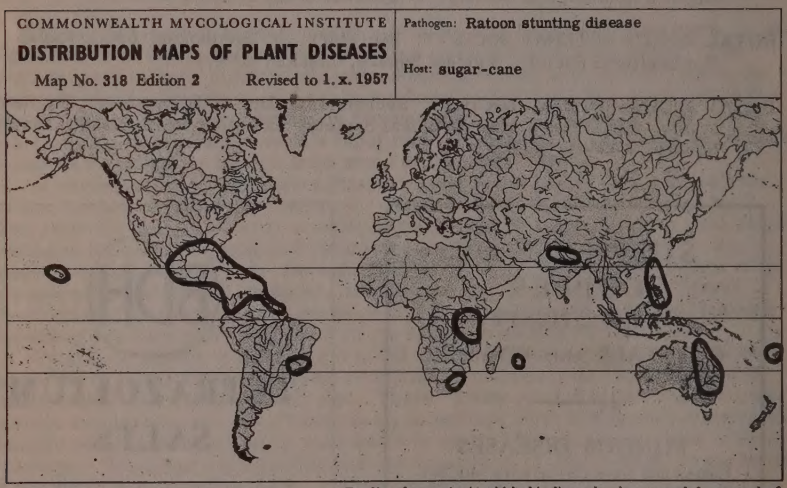
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